MTH 3240 Lab 3 **Answer Sheet**

☺ ☺ ☺ Due Thu., Feb. 13 ☺ ☺ ☺

1 Part A

1.1 Radioactivity Data Set (Cont'd from Lab 1)

1. Give the values of the statistics:

   $\bar{X}$ = _____

   S = _____

2. Give the value of the standard error:

   $S_{\bar{X}}$ = _____

3. Give the value of the test statistic (that you computed):

   t = _____

4. Give the value of the test statistic (that `t.test()` returns):

   t = _____

   Is the value of the test statistic from `t.test()` the same as the one you computed in Step 3 (Yes/No)? _____

   Give the p-value for the test: p-value = _____

   Recall that the ***decision rule***, using the **p-value approach** with level of significance $\alpha = 0.05$, is:

   Reject H_0 if p-value $< \alpha$
   Fail to reject H_0 if p-value $\geq \alpha$

Using level of significance $\alpha = 0.05$, should we reject or fail to reject H_0 (Reject/Fail to Reject)? _____

Based on the conclusion of the hypothesis test, is there statistically significant evidence that the true (unknown) mean ^{137}Cs concentration μ is less than 215 pCi/L (Yes/No)? _____

2 Part B

2.1 Radioactivity Data Set (Cont'd)

1. Give the value of the t critical value: $t_{0.05,9} =$ _____

Using the observed **test statistic value** t from Part A, the t *critical value* from Step 1, and the **decision rule**

Reject H_0 if $t < -t_{0.05,n-1}$
Fail to reject H_0 if $t \geq t_{0.05,n-1}$

Should we reject or fail to reject H_0 (Reject/Fail to Reject)? _____

Is there statistically significant evidence that the true mean radiocesium level μ is less than 215 (Yes/No)? _____

Is your conclusion using the rejection region approach consistent with the conclusion you came to using the p-value approach in Part A (Yes/No)? _____

3 Part C

3.1 Radioactivity Data Set

1. NA
2. NA
3. ***Don't*** print the plots, just answer the following question. Do the *logs* of the radiocesium data appear to be more normally distributed than original data (Yes/No)? _____

4. For the t test using the *logs* of the radiocesium data, please answer the following:

   The test statistic value is $t =$ _____

   The p-value = _____

   Using level of significance $\alpha = 0.05$, state the conclusion (Reject/Fail to Reject H_0)? _____